CHBE 611 – Advanced Topics in Thermodynamics

TR 8:00 – 9:15 AM | Location: DCH 1046 | Spring 2019

Instructor: Francisco M. Vargas, Ph.D.
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Office Hours: by appointment

Text: Prausnitz, J.M., Lichtenthaler, R.N., and De Azevedo, E.G., 1998, Molecular Thermodynamics of Fluid Phase Equilibria, 3rd Ed, Prentice-Hall.

Grading Policy:

Participation + homework	20 %
Computer problems	30 %
In-class exams (2 x 20% ea)	40 %
Final project	10 %

Grade	%	Grade	%
A+	≥ 97	C+	77.0 – 79.9
A	93.0 – 96.9	C	73.0 – 76.9
A-	90.0 – 92.9	C-	70.0 – 72.9
B+	87.0 – 89.9	D+	67.0 – 69.9
B	83.0 – 86.9	D	63.0 – 66.9
B-	80.0 – 82.9	D-	60.0 – 62.9
		F	<60

Honor Code:

- Homework and computer problems can be discussed in groups; however, only your own work should be turned in.
- You are forbidden to look at old tests, computer projects and/or assignments.

Course Topics:

1. Introduction; Review of the Laws of Thermodynamics
2. Phase equilibrium criteria; fugacity of mixtures
3. Fugacity coefficient and relation to PVT data
4. Virial equation of state
5. Corresponding states
6. Liquid solutions; ideal solutions
7. Activity coefficient and excess functions
8. Vapor-liquid equilibria (VLE)
9. Liquid-liquid equilibria (LLE)
10. Gas-liquid and solid-liquid equilibria
11. High pressure phase phenomena
12. Chemical reaction equilibria
13. Homogeneous, heterogeneous, and multiple reactions
14. Introduction to electrolytes
15. Introduction to molecular simulation
16. Introduction to statistical thermodynamics; distribution law
17. Relation to thermodynamic properties

Any student with a disability requiring accommodations in this course is encouraged to contact me after class or during office hours. Additionally, students should contact Disabled Student Services in the Ley Student Center.